

What is claimed is:

CLAIMS

1. An internal bracing system for a vertical wall having straw bales stacked in courses on a foundation wall comprising:

5        a plurality of spaced-apart bracing ladders attached to the foundation wall and rising vertically therefrom wherein some of the bales abut said ladders and some of the bales are surrounded by said ladders.

10      2. The system of claim 1 wherein said ladders have bale windows large enough to surround a straw bale.

10      3. The system of claim 2 wherein said ladders further have bale abutments between ladder windows which prevent a bale from passing through said ladder.

15      4. The system of claim 3 wherein said ladder windows and ladder abutments alternate vertically along the ladder at intervals approximately equal to the height of a bale.

15      5. The system of claim 4 wherein said ladders are formed from lengths of rebar tack welded together.

15      6. The system of claim 1 wherein the space between said ladders along the foundation wall is approximately equal to three bale lengths.

20      7. The system of claim 4 wherein the vertical wall has corners and said ladders include mid-wall ladders between the corners and corner ladders at the corners.

20      8. The system of claim 7 wherein said corner ladders are mid-wall ladders at right angles to each other.

25      9. The system of claim 1 wherein said ladders comprise two spaced-apart rails connected by struts.

25      10. The system of claim 9 wherein said struts define spaces between said rails large enough to surround a bale.

30      11. The system of claim 1 further comprising:  
30           X-shaped spars sized to straddle a bale located at the end of bales stacked on the foundation wall.

30      12. The system of claim 11 wherein the bales, when stacked on the foundation wall, have a length measured along the length of the foundation, a height that measures the vertical dimension of the bales, and a width, and

the foundation wall includes anchor dowels affixed in the foundation wall and extending vertically therefrom, wherein said X-shaped spars comprise:

an X-shaped core and a leg extending from each end of said X-shaped core wherein the distance between pairs of legs is greater than the width of a bale; and further comprising:

connecting rods extending vertically from an anchor dowel to the top of the bale stack for connecting a plurality of said X-shaped spar legs and said anchor dowel.

13. The system of claim 2 further comprising:

10 a stiffening ladder disposed horizontally onto a course of bales and attached to at least two bracing ladders.

14. The system of claim 13 wherein said stiffening ladder is sized to pass through a said bracing ladder window.

15. A straw bale core wall with an internal bracing system comprising;

15 a foundation wall having a plurality of spaced-apart anchor dowel pairs affixed to said foundation wall and extending generally vertically therefrom;

20 a plurality of mid-wall bracing ladders affixed to said foundation wall at said anchor dowels and extending vertically to a height generally equal to the height of the wall; and

a plurality of straw bales stacked on said foundation wall in a running bond, with some of said bales abutting said bracing ladders and other of said bales surrounded by said bracing ladders.

16. The straw bale core wall with an internal bracing system of claim 13  
25 wherein said bales have ends, further comprising:

X-shaped spars, each having an X-shaped core and legs extending from the ends of said X-shaped core, disposed at the end of some of said bales, with said legs straddling bales above and below the bale where said X-shaped spar is located.

30 17. The straw bale core wall with an internal bracing system of claim 16 wherein a plurality of said X-shaped spars are aligned vertically with one of said anchor dowels and further comprising:

a connecting rod affixed to a said anchor dowel and some of said X-shaped spars vertically aligned with said anchor dowel.

18. The straw bale core wall with an internal bracing system of claim 17 wherein each of said connecting rods is affixed to all of the X-shaped spars vertically aligned with said anchor dowel.

19. A method of constructing a straw bale core wall onto a foundation

5 wall comprising:

attaching to the foundation wall mid-wall bracing ladders which extend vertically to the height of the wall;

stacking bales onto the foundation in courses such that some bales abut a mid-wall bracing ladder and some bales are surrounded by a mid-wall  
10 bracing ladder.

20. The method of claim 19 wherein the mid-wall bracing ladders have two sides and for each bale that abuts a mid-wall bracing ladder, there is another bale in the same course that abuts the other side of the same mid-wall bracing ladder.

15 21. The method of claim 20 wherein the bales are stacked in a running bond and for each bale that abuts a mid-wall bracing ladder, there is a bale immediately above that is surrounded by the same mid-wall bracing ladder.

22. The method of claim 21 further comprising the steps of:

20 placing an hourglass-shaped spar at the end of some of the bales in the running bond; and

connecting all vertically aligned hourglass-shaped spars together and to the foundation wall.

23. The method of claim 19 further comprising the step of:

stiffening the bond by disposing a stiffening ladder horizontally onto  
25 the top of at least one course; and

attaching the stiffening ladder to at least two bracing ladders.

24. The method of claim 23 wherein the wall has at least six courses and the stiffening ladder is disposed on top of the sixth course.

25. The method of claim 23 wherein the wall has more than six courses  
30 and stiffening ladders are disposed on the top course and the course closest to the mid-height of the wall.

26. A method of constructing a straw bale core wall onto a foundation wall where the foundation wall has corners, comprising the steps of:

attaching to the corners of the foundation wall corner bracing ladders

which extend vertically approximately to the height of the straw bale core wall;

attaching to the foundation wall between corner ladders mid-wall bracing ladders which extend vertically approximately to the height of the  
5 straw bale core wall;

stacking straw bales in courses onto the foundation wall in a running bond wherein some of the bales abut mid-wall ladders and other bales are surrounded by mid-wall ladders.

27. The method of claim 26 wherein the straw bales have ends and at  
10 least one end abuts the end of another bale in the bond.

28. The method of claim 27 further comprising the steps of:

installing a cross-shaped spar with spar legs between the ends of  
abutting bales; and

15 connecting all vertically aligned cross-shaped spars together and to  
the foundation.

29. The method of claim 27 further comprising the step of:

installing a horizontal preassembled stabilization ladder onto the top  
course of bales and securing it to mid-wall ladders.

30. The method of claim 27 further comprising the step of;  
20 plumbing the corner ladders and mid-wall ladders prior to stacking  
bales.